

VISION

To change the tradition bound construction industry.

MISSION

To facilitate the transfer of technology that will encourage participation and empower communities on a global basis.

INTRODUCTION

moladi Construction Systems (MCS), winner of the South African Bureau of Standards Design for Development Award, is a unique patented plastic injection moulded formwork system that is revolutionising the construction industry. **moladi** focuses on creating job opportunities within the labour environment and facilitates the speedy delivery of hurricane and earthquake resistant houses, clinics and schools etc. by reducing construction cost without compromising a high standard of quality.

HISTORY

With the intended purpose of "Housing the Nations", Hennie Botes embarked on an endeavour to develop a system to construct durable structures of quality in the shortest possible time. This system has developed into a construction technology that addresses four key challenges embodied in the low cost housing shortages facing developing countries namely: -

- Lack of resources
- Insufficient funds
- Shortage of skills
- Constraint of time

moladi construction technology has been developed and improved over a period of 13 years. It represents the most advanced technology and innovations in the industrial construction of low-cost and affordable houses, schools, clinics and other structures and is a leader in this field.

THE MARKET

Due to the neglect of the poor and very poor over many decades, the real source of market promise is not the wealthy few in the developing world, or even the emerging middle-income consumers: It is the billions of *aspiring poor* who are joining the market economy for the first time.

Countries that lack the infrastructure to meet basic humanitarian needs provide the ideal situation for the development of environmentally sustainable technologies and products. Housing is a primary sector of industry that can contribute towards the upliftment and empowerment of communities. The building industry's emphasis has traditionally been on commercially viable projects sidelining low-cost housing and the implicated low profit margins. As a rule, small contractors build low-cost affordable houses in a traditionally ineffective way, with low quality materials, inferior workmanship, little or no professional support, and most importantly, no benefit of economy of scale.

By focusing on aspects of the construction industry, it is possible to generate wealth and opportunities for emerging communities by introducing and facilitating mutually beneficial projects between these communities and the established formal sector. Mobilise joint ventures and partnerships involving business, community based and non-governmental organisations, facilitating the establishment of Co-operatives are but some of the options that can bring forth "Sustainable Development".

The opportunity for creating "sweat equity" is also a great incentive for building one's own home. To more and more people this is very important, because their sweat equity is the only equity they can muster. Communities who are building their own homes do it in a state of excitement and eagerness.

For companies with the resources and persistence to compete at the bottom of the economic pyramid, the prospective rewards include the incalculable contribution to social and economic development, growth and substantial profits. This would ultimately result in the multiplication of secondary economic activities and the development of small and medium scale enterprises, which would result in an increase in job opportunities.

THE PRODUCT

Combining a lightweight plastic injection moulded formwork system, branded as **moladi**, and a South African Bureau of Standards approved lightweight aerated mortar (concrete with no stone), a cast in situ monolithic (one piece) reinforced walling system is created. The result is a fast track and cost effective construction technology.

THE FORMWORK

moladi

- Patented
- Modular
- Reusable
- Cost effective
- The only comprehensive plastic injection moulded formwork system
- The only comprehensive machine-made formwork system
- Produced to the highest quality standards – ISO 9002
- Comprehensive and incorporates many additional innovations
- Unlimited production capacity.
- Without dependence on skilled labour, components are produced by injection moulding, which allows high production of very exacting quality standards, in accordance to ISO 9002.
- Due to the production process, an unlimited number of sets of house moulding kits can be produced in any country, at any one time.
- The numbers of components are modular, making adjustments in dimensions simple, adapting to endless design layouts.
- Lightweight and can therefore easily be handled and transported.
- Does not require skilled labour to assemble, erect or strip.
- It produces a smooth off-the-mould surface, which does not require plastering.
- International product import description - HS code 39.25.90
- Can be recycled

THE PROCESS

moladi modular plastic components, measuring 300 mm x 300 mm, are joined to form a wall configuration of any desired length and height depending on the lay out of the required structure. These lightweight assembled sections (8 kg/m²) are linked together to form wall cavities of either 100mm or 150mm. Reinforcing, windows, doors and services are located in-situ. This is completed in four hours by local unskilled labour. Thereafter the cavity is filled with a cementitious material consisting of local river sand, cement, water and admixture. This produces a fast curing aerated mortar that is flow able, waterproof and possesses good thermal and sound insulating properties. This secondary process of filling the formwork is completed within two hours, again by local unskilled labour. The following day **moladi** formwork is removed, within two hours, in the pre-assembled sections, not panel by panel, and can immediately be re-erected on an adjoining site to be used on a repetitive basis, thus speeding up the entire construction process.

Cast in one day, the structure is now ready to receive the roof and other finishes necessary to turn the building into a home. Once removed the smooth off shutter finish eliminates the need to plaster. The various house designs are therefore capable of being expanded as family demands and income availability dictate in future years

THE STRUCTURE

- Reinforcing is designed according to the requirements of the structure and specified by a Professional Engineer depending on soil conditions i.e. Clay, expanding soils, collapsing soils, dolomite etc. Also taking into account if the structure would be subjected to earth tremors, quakes or hurricanes.
- As the structure is constructed in a homogenous way with reinforcing placed in strategic positions, the building is more resistant to seismic movement.
- Electrical and water piping is located onto the formwork and cast in situ.

THE MORTAR

- One cubic meter of mortar (concrete without stone aggregate) consists of - 1650 kg or 0.75 m³ local decomposed granite or as we call it in Africa - River Sand, 250 kg OPC (Ordinary Portland Cement) 5-litre chemical (cocktail of super plasticizer, air entrained, latex etc) 200 litres water
- Fly ash can be used as an extender to substitute the use of cement, in order to reduce the volume of cement but will still achieve the same ultimate compressive strength (mPa).

The density of the mortar will vary depending on the sieve grading of the sand used, but will range between 1600 to 1800 kg per cubic meter and a compressive strength of between 10 and 20 mPa can be achieved in a 28-day period, depending on the Cement/Water ratio.

Advantages

- An affordable technique to effectively build durable, earthquake, cyclone resistant shelter, whilst maintaining acceptable design aesthetics for social acceptability amongst a wide range of cultures.
- An alternative way to enable and empower sections of society, by providing a building technology that encourages self-participation.
- A cost effective, holistic design and building technology, which far outweighs many of today's retrofit schemes.
- A realistic, modern alternative to overcome the widespread misuse of scarce materials, particularly timber, by introducing a system that combines **moladi** with other indigenous materials.
- Reduces waste
- Not dependent on traditional skills associated with conventional building methods of brick and mortar.
- Does not require skilled labour to assemble, erect or strip
- Cost effective and environmentally friendly formwork system that can be recycled.
- Simple to produce and overcomes the manifold problems of traditional timber and steel formwork;
 - Not only is timber formwork expensive, but also a product that affects the stability of the natural environment
 - Manufacturing and erection requires skilled artisans
 - High cost and weight disadvantage
 - Slow assembly and stripping times
 - Susceptibility to damage
 - High amortisation costs
- **moladi** is a complete and versatile system for rapid production of mass housing schemes.
- Incorporates available local finishing materials and local workers who are trained on the job at their location.
- Incorporates the support of all professional services.
- It allows unskilled workers to build comfortable homes and various other structures of high consistent quality.
- More cost effective than traditionally built houses with more value for money.
- Lightweight formwork and can therefore easily be handled and transported.
- The numbers of components are modular, making formwork adjustments in dimensions simple, adapting to endless design configurations
- Predictive pre planned construction progress, so worker's performance can be measured in detail from day to day, which makes the construction process more manageable, controllable and efficient.
- Requires a much lower investment than any other industrial housing system
- The investment is recouped in a short period and over fewer units.

TERRITORIES

Agreements with major international affiliates have been concluded to distribute the products overseas. As a result of these agreements, the sales in the international market have accelerated, resulting in a substantial increase in production.

The first exclusive territorial distribution license agreement was concluded in March 2003 for Suriname, and awarded to the retired Professional golfer Mr. Ty Wilkinson from Florida, U.S.A. In May of this year we undertook to extend the territory to include the Caribbean Islands, French and English Guyana. The World Bank has approved (in Principal) a loan application of \$200,000,000.00 and Mr. Ty Wilkinson is in the final stages of receiving approval from the U.S.A Government and IRS to establish a Section 21 Company that will focus on the delivery of housing for the poor in these countries. According to World Bank projections, the population at the bottom of the pyramid could swell to more than 6 billion people over the next 40 years, because the bulk of the world's population growth occurs there.

Exclusive territorial distribution license agreements have also been awarded for Mexico, Brazil, Chile and Argentina.

Currently negotiations are on track to appoint Exclusive territorial distribution license agreements for Kenya, Zambia, Botswana, Angola, Sudan, Egypt, Nigeria, Ethiopia, Panama, Central America, Venezuela, Sri Lanka, India and Indonesia. We have recently received an enquiry from Ministry of Construction (MOC) of China to construct show units in 10 major cities.

moladi is enjoying increased interest from construction companies, developers, Government Departments, local communities, not only from South Africa, where **moladi** plays a major role in the Reconstruction Development and affordable housing programmes, but from many other African Nations, the America's and Asia.

QUALITY ACCREDITATION

moladi has attained certification from the Agrément Board issued by the CSIR (Council for Scientific and Industrial Research) Certificate 94/231, has passed numerous tests by the SABS (South African Bureau of Standards) and is approved by the major Banks and financial institutions for long term end user financing. In addition, professional support and backup services have been enrolled to provide additional input to further enhance the delivery of the holistic product.

MANUFACTURING

moladi manufacturing takes place in Port Elizabeth, the 5th largest city in South Africa. A port city on the Indian Ocean coastline located halfway between Cape Town and Durban. Our factory consist of three departments: Production – Toolroom - R&D
Our manufacturing capabilities are quality orientated aimed at high volume.

Our CEO is Mr. H. Botes who is based in Port Elizabeth and oversees the day to day running of the company, liaises with clients and is also responsible for R&D. Our staff contingent consists off Production Manager Mr D Viljoen. HOD at our Johannesburg offices is Miss S. Botes, who is equipped to handle all enquiries and compile detailed cost estimates, design layouts, process orders and facilitate training scheduling. All shipping and airfreight and is undertaken by SafcorPanalpina.

AWARDS



TRANSFER OF TECHNOLOGY

We provide and assist in: -

1. On site training and video
2. Technical manuals and support
3. Design or Architectural assistance
4. Professional Engineering support
5. Quality procedures
6. Suppliers and Purchasing databases
7. Formulation of Contractual Agreements
8. Advertising and Marketing assistance
9. Proprietary Technology
10. Software packages
11. Information Technology Data Bases
12. Project Management principals
13. Assemble moladi
14. Erect moladi
15. Mix design of mortar and strengths
16. Filling of moladi formwork
17. Removing of moladi
18. Finishing
19. Handover

For further information you are invited to visit www.moladi.com

"He who will not apply new remedies must expect new evils, for time is the greatest innovator"